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5 A masking aperture for a photomask illumination system provides controlled on-axis and off-axis illumination. The masking aperture has a dithered pattern of pixels. The intensity of the pattern controls the illumination of the photomask. The masking aperture pattern defines one or more zones of illumination. Zones comprise elements that are patterned in accordance with a selected wavelength of incident light to diffract the incident light into an illumination pattern for illuminating a photomask. Each of the elements is constructed with a matrix of pixels. In the preferred embodiment the array of pixels is 8×8 . The number of elements is generally greater than 3×3 .

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